



SLOVENSKI STANDARD
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**Embalaža - Načrtovanje, ki omogoča recikliranje plastične embalaže - 3. del:
Postopek za ocenjevanje možnosti sortiranja plastične embalaže**

Packaging - Design for recycling of plastic packaging - Part 3: Sortability evaluation process for plastic packaging

Verpackung - Recyclingorientierte Gestaltung von Kunststoffverpackungsprodukten - Teil 3: Bewertung von Sortierverfahren von Kunststoffverpackungen

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ICS:

13.030.50	Recikliranje	Recycling
55.020	Pakiranje in distribucija blaga na splošno	Packaging and distribution of goods in general
83.080.20	Plastomeri	Thermoplastic materials

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English Version

Packaging - Design for recycling of plastic packaging - Part 3: Sortability evaluation process for plastic packaging

Verpackung - Recyclingorientierte Gestaltung von
Kunststoffverpackungsprodukten - Teil 3: Bewertung
von Sortierverfahren von Kunststoffverpackungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 261.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 18120-3:2024) has been prepared by Technical Committee CEN/TC 261 “Packaging”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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prEN 18120-3:2024 (E)**Introduction**

EN 18120 consisting of 15 parts aims via a series of guidelines and protocols to establish consistency and improvement for the design for recycling of household, industrial and commercial plastic packaging.

- Part 1: Definitions and principles for design-for-recycling of plastic packaging
- Part 2: Process and governance to evaluate the recyclability of plastic packaging
- Part 3: Sortability evaluation process for plastic packaging
- Part 4: Guideline for PET bottles
- Part 5: Guideline for PET rigid packaging (except bottle)
- Part 6: Guideline for PE and PP rigid packaging
- Part 7: Guideline and protocols for PE and PP flexible packaging
- Part 8: Guideline for PS and XPS packaging
- Part 9: Guideline for EPS packaging
- Part 10: Recyclability evaluation process for plastic packaging — Protocols for PET bottles
- Part 11: Recyclability evaluation process for plastic packaging — Protocols for PET other rigid packaging
- Part 12: Recyclability evaluation process for plastic packaging — Protocols for PE and PP rigid packaging
- Part 13: Recyclability evaluation process for plastic packaging — Protocols for PE and PP flexible packaging
- Part 14: Recyclability evaluation process for plastic packaging — Protocols for PS and XPS packaging
- Part 15: Recyclability evaluation process for plastic packaging — Protocols for EPS packaging

Design for recycling guidelines are a common way of describing compatibility with plastic packaging collection, sorting and recycling into high quality recycled plastic into state-of-the-art facilities. They provide guidance on the level compatibility, defined as:

- green: Packaging constituents with full compatibility with recycling;
- yellow: Packaging constituents with limited compatibility with recycling;
- red: Packaging constituents which are not compatible with recycling.

Recyclability guidelines will require regular review and improvement to reflect innovations in design, collection, sorting and recycling.

The design for recycling guidelines provided in this series of standards are representative of the state of the art in Europe and cover all steps from design for recycling, packaging waste collection, sorting, recycling into recycled plastic and to use in a new application.

Packaging recyclability is the combination of five parameters: packaging designed for recycling, packaging waste collection, sorting when necessary, recycling and use of recycled plastic in a new application. This series of standards covers one parameter: the design for recycling.

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prEN 18120-3:2024 (E)

1 Scope

This document is an input for a standard on the recyclability evaluation process of plastic packaging with respect to compatibility of the design with the collecting and sorting processes for the plastic used.

This document covers any household plastic packaging where the main body is made of PET, PE, PP or PS material.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 18120-1, *Packaging — Design for recycling of plastic packaging — Part 1: Definitions and principles for design-for-recycling of plastic packaging*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 18120-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp/>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1 near infrared NIR

wavelength range from 0,75 μm to 1,9 μm , in which certain infrared instruments operate

Note 1 to entry: The spectral range of many NIR sensors is typically from 0,90 μm to 1,70 μm .

[SOURCE: ISO 10878:2013, definition 1.84]

3.2 visual spectrum VIS

visible part of the electromagnetic spectrum

Note 1 to entry: Used for the colour sorting of plastic packaging waste.

Note 2 to entry: Most optical sorters combine VIS detection with NIR detection.

3.3 eddy current

electric current induced in a conductive material by a varying magnetic field

[SOURCE: EN ISO 12718:2019, definition 3.1.12]

3.4 ferromagnetic

term applied to materials that can be magnetized or strongly attracted by a magnetic field

[SOURCE: ISO 15463:2003, definition 4.1.40]

3.5

(over-band) magnet

device intended for the separation of packaging waste made of or containing ferromagnetic metals

3.6

ballistic separator

device that uses different impact behaviour for separation

Note 1 to entry: in the application for sorting plastic packaging, the separation of flexible and rigid packaging is intended. A typical use is to separate two-dimensional packaging waste (such as flexible packaging) from three-dimensional packaging waste (such as bottles).

3.7

eddy current separator

device intended for the separation of packaging waste made of or containing non-ferromagnetic metals

Note 1 to entry: Eddy current separators will also separate ferromagnetic metals if they are part of the input. However, eddy current separators are generally used behind a (over-band) magnet, which removes such metals.

3.8

windshifter

device intended for the separation of packaging waste into a light fraction and a heavier fraction

Note 1 to entry: A typical use is to separate flexible packaging waste from other types of waste such as bottles.

3.9

drum sieve

trommel sieve

device intended for the separation of packaging waste based on differences in size

3.10

optical sorter

sensor-based sorting

device intended for the separation of packaging waste based on spectroscopy in the NIR and/or VIS range, detecting and classifying objects based on their material and/or colour

3.11

material recovery facility

MRF

plant for sorting and pre-processing materials from comingled waste for resource recovery

Note 1 to entry: A Material Recovery Facility (MRF) typically receives the input from a separate collection scheme for consumer packaging (including out-of-home collection) and utilizes a series of sorting steps, allowing to separate on a packaging level the collected packaging waste into a different types of bales (per material type and/or colour), which will subsequently be sent to either a PRF or reprocessor.

Note 2 to entry: A MRF is generally a facility that sorts and prepares collected household plastic packaging waste into (target) fractions suitable for onward dispatch to a PRF and/or reprocessor.

prEN 18120-3:2024 (E)**3.12****plastic recovery facility****PRF**

facility that sorts and prepares mixed plastic packaging waste fractions into separate (target) fractions for onward use at reprocessors

Note 1 to entry: A Plastic Recovery Facility (PRF) further separates mixed plastic packaging streams on a packaging article level into more fractions (material type and/or colour) than typically created by a MRF.

3.13**reprocessor**

business that takes materials which have been sorted (e.g. at a MRF) and uses them to produce new secondary raw materials

Note 1 to entry: A reprocessor (sometimes also called a recycler or reclaimer) typically receives pre-sorted bales from MRF's and/or PRFs and uses a reprocessing process (mechanical or advanced recycling including but not limited to dissolution recycling, depolymerization, pyrolysis, gasification) to convert them typically into recycled pellets, that can be used again in plastic applications (within or outside packaging), replacing virgin resin. Reprocessors can also have a series of devices to pre-sort the packaging (on a packaging article level) prior feeding it into a reprocessing system.

Note 2 to entry: Sorting equipment at a reprocessor which is different from that at a MRF/PRF (e.g. delabellers) will be considered in the relevant packaging format specific guideline parts of this series of standards. (e.g. PET Bottle Guidelines part 003 in case of delabellers)

3.14**plastic packaging test sample**

(plastic packaging to be assessed via this document, e.g. the SAMPLE): the packaging under investigation

Note 1 to entry: Plastic packaging test sample can be both in market packages as well as new innovate packaging developments not placed in market yet.

3.15**C&I waste**

commercial and industrial packaging waste (typically (but not limited to) collected at retailers and businesses)

3.16**target fraction**

intended type of packaging or material for a plastic packaging to be identified as in the sorting process

Note 1 to entry: It is the desired stream so it can enter the preferred reprocessing (examples are given in Annex D).

3.17**test facility**

location where this test methodology is executed

Note 1 to entry: Differentiation is made between:

- lab scale testing (including single unit operation testing): facility that has 1 or few Unit operation tests in place, typically not connected to each other;
- pilot scale testing (facility having multiple industrial equipment in place that are connected but only being used for testing);
- industrial scale testing (MRF): commercial automated MRF/PRF.

3.18**sortability**

ability of a packaging to be identified and separated from a packaging waste stream into an intended plastic packaging or material fraction for further reprocessing

3.19**sortability yield**

percentage of the valuable material reporting to the concentrate (target material sorting fraction) with reference to the amount of material in the feed

Note 1 to entry: Also sometimes called percent recovery.

Note 2 to entry: A Plastic Recovery Facility (PRF) further separates mixed plastic packaging streams on a packaging article level into more fractions (material type and/or colour) than typically created by a MRF.

4 Sortability of plastic packaging waste**4.1 Introduction**

This document provides a sorting protocol to test household plastic packaging test samples consisting of a PET (Rigids), PE (Rigids and Flexibles), PP (Rigids and Flexibles), PS and XPS (Rigids) or EPS main component, to determine their sortability into the respective target material fractions.

This protocol covers household plastic packaging formats, including but not limited to:

- flexible packaging;
- pouches;
- bags;
- rigid packaging (inclusive bottles, bottles including spray pumps, boxes...);
- tubes;
- pots;
- cups;
- trays;
- blister packaging.

Plastic packaging often contains multiple components. For example, a clear beverage bottle may be comprised of a PET bottle, a PE cap and a label. The target fraction for packaging waste is determined by the material (plastic) representing its main component(s), by weight – in this case the bottle. In this example of a PET beverage bottle, the target fraction therefore is PET bottles (specifically, the clear and light blue PET bottle stream). More examples can be found in Annex D.

A plastic packaging test sample containing predominantly (over 50 %) materials other than plastic or made of different plastics than the ones listed above shall not be tested according to this document.

Out of scope are the following:

- hazardous goods packaging waste;
- manual-only sorting operations;